Since 1 kilogramme molten steel possesses a heat content of 850 calories, there is effected by an impurity of 1 per cent-Si in the charge an increase of heat requirement of 15 calories . . . (58).

2. Ivjlucnee of Silica from Impurity of tlie, Metallic Charge and Additions.

Could one produce a charge of steel from a charge of 99 kilogrammes pure iron and 1 kilogramme silica, so there would originate from the latter (from 40) 4*78 kilogrammes slag, in which would he contained Q'5 kilogramme iron. One would then obtain 98*5 kilogrammes metal, and from (41), 2*88 kilogrammes Ca() or 4*60 kilogrammes limestone must be utilised in the formation of slag.

The products therefore take up heat as under:

Gals.

98-5 kilogrammes stool X3/50 ... = 34,475

4 "78 kilo^rainuiOH sla^X fiUo ... = 2,509

Carbonic acid 1'rom tho limestone . . 839

"37,823 1,980

3i),803~

Total heat in the products Decomposition of limestone rocjuiros

Total boat requirement . II oat set free : Combination of 1 kilogramme Si0.2

Combustion J<V .l,3

of 0*5 kilogramme

384 cals.

1,060

ThiiH hout requiromcmt .

Or 393 c-alorittH per kilo^rammo of Htoel.

1,0(50 38,743

One per cent, silica in the charge thus increaBes the heat demand for the production of 1 kilogramme steel by 893-—850 = 48 calories . . . (59).

8. Influence of Phosphorus.

From a charge consisting of 99 kilogrammes iron and 1 kilogramme phosphorus, there must (from 88 and p. 187) originate 99 kilogrammes steel and 5*9 kilogrammes slag, and further the charge would require 2 x 8*61 = 7*22 kilogrammes limestone (vide 88).